Rhodora

JOURNAL OF THE

NEW ENGLAND BOTANICAL CLUB.

Conducted and published for the Club, by

BENJAMIN LINCOLN ROBINSON, Editor-in-chief.

FRANK SHIPLEY COLLINS
MERRITT LYNDON FERNALD
HOLLIS WEBSTER } Associate Editors.

WILLIAM PENN RICH
EDWARD LOTHROP RAND } Publication Committee.

Vol. 2. April, 1900. No. 16.

CONTENTS:

The slime moulds. *T. H. Macbride* 75
A blue-fruited huckleberry. *B. L. Robinson* 81
Carex Novae-Angliae in eastern Massachusetts. *G. G. Kennedy* 83
Capsella in January. *John Murdoch, Jr.* 84
Notes on Echinacea. *M. L. Fernald* 84
Pink-Flowered Rubus triflorus. *H. W. Jewell* . . . 87
Eragrostis Frankii in Connecticut. *C. H. Bissell* . . . 87
Notes on Vermont Plants. *A. J. Grout* 88
Lists of New England Plants.—VI. Leguminosae. *J. R. Churchill* 89

Boston, Mass. 740 Exchange Building. | Providence, R. I. Preston & Rounds Co.

The Heintzemann Press, Boston

RHODORA. — A monthly journal of botany, devoted primarily to the flora of New England. Price $1.00 per year ($1.25 to all foreign countries except Canada); single copies, 15 cents. Notes and short scientific papers, relating directly or indirectly to the plants of the northeastern states, will be gladly received and published to the extent that the limited space of the journal permits. Forms will be closed five weeks in advance of publication. Authors (of more than one page of print) will receive 25 copies of the issue in which their contributions appear. Extracted reprints, if ordered in advance, will be furnished at cost.

Address manuscript and proof to

B. L. ROBINSON, 42 Shepard Street, Cambridge, Mass.

Subscriptions, advertisements, and business communications to

W. P. RICE, 150 Commercial Street, Boston, Mass.

Single copies may be had from

E. L. RAND, Corresponding Sec'y N. E. Botanical Club,
740 Exchange Building, Boston, Mass.

OUT-OF-DOOR COURSES

In the study of Flowering Plants, Ferns, and Mushrooms, on the New Hampshire uplands, and in a part of the Connecticut valley, are offered to men and women by

THE ALSTEAD SCHOOL OF NATURAL HISTORY

during the five weeks beginning July 3, 1900.

Field courses are also offered in Ornithology, Biology, and Physiography.

The instructors are M. L. FERNALD, HOLLIS WEBSTER, RALPH HOFFMANN, and W. L. W. FIELD.

For detailed information address,

W. L. W. FIELD, Sec'y,

Milton, Mass.

HARDY American Plants and Carolina Mountain Flowers. Many new and rare species. We introduced to cultivation Rhododendron vaseyi, Shortia galacifolia, Tsuga caroliniana (Carolina Hemlock), Lilium grayi, Vaccinium hirsutum, and many others.

The famous local North Carolina plant DIONÆA MUSCIPULA (Venus' Fly-trap) is easily grown in a pot in any warm room.

Correspondence solicited.

HARLAN P. KELSEY,

Tremont Building, Boston, Mass.

Proprietor Highlands Nursery, Kawana, North Carolina.

Landscape Architect. Consultation and plans for improvement of estates and private or public grounds, suburban properties and resorts.

Entered at the Boston, Mass., Post-office as Second Class Mail Matter.

Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 2 April, 1900 No. 16

THE SLIME MOULDS.

Thomas H. Macbride.

(Plate 16.)

In view of the many points of curious and biologic interest attaching to the Slime Moulds, it is remarkable that they have not been more widely collected and studied in this country. They are ubiquitous; they grow in field and forest, in orchard and garden, about every farm, nor less in every hamlet, in town and in city, in our hot-houses in winter, in our flower-beds in summer. In fact, wherever anything else can grow, especially anything of the mould or fungus kind, there slime moulds, at one time or another, are sure to be found. True, the smallness of their fructifications removes them somewhat from ordinary discovery, but some of them are large enough, and nearly all of them make up in the number of their sporangia what may be lacking in size, so that, on the whole, slime moulds are certainly not less conspicuous than other small forms of fungal life.

Besides, they possess in most of their species, in both color and structure, a certain curious elegance that makes them very attractive to every one who has the slightest sense of artistic delicacy and beauty.

But far beyond all this lies the interest attaching to these forms as living things. In their life-history they are unlike anything with which we elsewhere have to do. They are like moulds in that they use as food organic materials; they are unlike moulds in that they are destitute of hyphæ, and in their vegetative phase present simply a mass of slime, apparently without organization, without form, without structure of any kind; and yet living, moving, intact, cellular, multinuclear, and in growth and development evincing all the complexity of mitotic cell-division. They live as naked protoplasm, protoplasm in its "mineral

condition," if one might so say, creeping about on this worn old planet with all the freshness of Creation's youth. It is of course needless to mention here the interest attaching to protoplasm. This is the form of matter which everywhere fascinates the student of biology; the secret of life is with it. For the last twenty-five years, in all sorts of physiologic and biologic treatises, the tiny amœba has been made to play the leading rôle; but the plasmodium, that is, the vegetative, active phase of a slime mould, is worth a thousand amœbas; it exhibits vital phenomena on such a macroscopic scale. Contractility, irritability, assimilation, automatism, and all the other wondrous properties, so called, of living matter are here to be seen in their most beautiful display.

In our university laboratory a few weeks since, we had the plasmodium of a Tilmadoche (*T. polycephala* Schw.). To a piece of *Agaricus sapidus* the size of one's hand a little of the clear yellowish plasmodium was transferred, and the whole covered by a large bell-glass. The plasmodium increased rapidly in size, perceptibly so within an hour. In twenty-four hours, all over the walls of the bell-jar there were sheets and streams of protoplasm spreading and massing like an invading army in all directions, while the agaric melted before it. Fresh pieces of agaric were from time to time supplied, and were as rapidly consumed, until the plasmodium had increased to such dimensions that it completely lined the glass and hung down in streaming pillars and columns from the summit. The plasmodium was divided, and every one who chose made a culture for himself; the streams were induced to run and spread on slides, transferred to microscopes and so watched, as the currents oscillated to and fro; some parts were gathered on cover-glasses, stained and mounted to show the swarming nuclei. All the wonderful phenomena seemed susceptible of indefinite continuance; but unhappily cold weather came upon us; our supplies of fresh agaric failed. We softened up dry material of similar sort, but our slime mould, delicate connoisseur that it was, refused to be fed on food of our selection further, and presently succumbed to the assaults of a horde of real moulds and fungi that found our new supplies of pabulum quite suited to their less discriminating taste. The eater in turn was eaten. In the case of several bell-jars, however, we allowed the plasmodium to continue undisturbed its favorite food-supply and made no attempt at all to set forth a new menu. In these cases the net-work streamed about a

while, lost color, and finally everywhere transformed itself into a thousand tiny, sculptured, capitate sporangia, raised each upon a slender fibrous stem, each sporangium packed with abounding spores, in form and color characteristic of the species. Only in one particular were the spores abnormal; not a few were far too large. It would seem that in some cases the thin pellicle of cellulose which we call the cell-wall had enclosed, to form the spore, two nuclei instead of one as is the rule. Certainly the conditions of fruiting were, after all, not quite normal. Fruiting ensued before cell-division had had time in each case to become complete; hence the giant or double spores. Some of these spores, a few days later, were sown in water, placed in an incubating oven, where, in a few hours, they germinated by the simple breaking of the cell-wall, each giving rise to a tiny amœboid speck of protoplasm, motile, free. These, could they have found nutrition, would no doubt soon have greatly multiplied by simple cell-division, and gone on at length to form a new plasmodium like that with which we started.

Such was our experience in the laboratory, correspondent, no doubt, in all essential particulars to that which occurs out of doors in all appropriate seasons of the year, and such is the life-history of the slime mould generally.

But after all these were laboratory experiments, like nature, correspondent indeed, but still meagre and poor by comparison, as physiological laboratory experiments are pretty sure to be. To study slime moulds and know them we must go out of doors and be content to stay out of doors, for a day at a time sometimes. The laboratory may help us, to be sure, but the lack of it need not greatly hinder us. In moist and mossy woods, by perennial springs and streams these things are at their best. The Atlantic seaboard affords, therefore, the richest variety for this continent, the woods of Maine, and all New England, New Jersey, Pennsylvania, nor less the region farther south. Students in these localities have, accordingly, some advantages; they have profusion and variety.

In the latitude of New England the best time to begin these studies is perchance in June. The climate of Iowa, precipitation now aside, is perhaps not very different from that of Massachusetts. With us about the time the Mertensia shakes out its blossoms and the Polemonium is in fullest flower, on some fair day that breathes the earliest airs of summer, the student wandering in the woodland is sure to see, perhaps

flat on the surface of a log or stump, perhaps half-way up the bole of some oak tree, perhaps spread in golden profusion over some bed of leaves or even living moss, the forming fructification of *Fuligo*, a mass of yellow not unlike the broken yolk of an egg, sometimes tinged about the margin by shades of red and brown, but conspicuous, commanding attention alike by its color and its substance, now as two hundred years ago, when Marchand first described it about the tan-yards of Paris. This is at once the largest of the slime moulds and, with us, the earliest to form its fruit. In 1882, Sachs, in his celebrated lectures on the Physiology of Plants, tells of this species in language which will doubtless seem a wonder-story even yet to many readers; yet all that Sachs says of this species is strictly true. Schweinitz, who both in this country and in Europe, a hundred years ago, collected and named not a few slime moulds, but who really little understood their nature, tells of a specimen found by a blacksmith's forge (in South Carolina), in the morning, calmly fruiting on iron that had been red hot the night before! A century or two earlier, this had certainly been a portent or a prodigy. If our student is fortunate enough to find his specimen in its mucilaginous condition, having just concluded its migrations, he may leave it to be revisited, *Jove favente*, on the following day, when instead of slime he may expect to find a more or less hardened crust like stiffened foam, overlying a mass of sooty spores, dry and fine. This is the final fruit. A few days later the wind will have borne the spores away and only a thin whitish film may remain behind to mark the place of the singular transformation.

Fuligo is perhaps the first slime mould to be recognized by the beginner. If a student of fungi, especially if a collector of puff-balls, he has probably already made the acquaintance of the common *Lycogala epidendrum* (Buxb.) L. The plasmodium of this species is red, not a very deep red, but bright enough to attract attention; to the older writers suggestive of vermilion. This appears usually a little later in the year, say in July, August, and so through the fall.

Following closely on the maturing of *Fuligo*, or even contemporary with it, are to be found the plasmodia of many other species, less frequently observed because in general less conspicuous. They may be sought by rotting logs, around settled heaps of wind-driven leaves, in neglected corners of the garden. Here we may meet the pale venulose creeping threads of some of the *Didymia*, the richer yellows of the *Badhamia* species, the creamy nets of some of the Didermas,

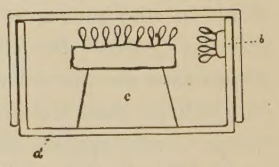
the snowy reticulations of *Diachea*. It must be understood in all cases that the color of the plasmodium in the same species varies with the progress of development, the food-supply and perhaps for other reasons to us unknown. The tints are not inherent, but are due to the presence of particles suspended in the protoplasmic stream. A plasmodium accordingly often loses its characteristic color as it passes into fruit.

Later in the season the plasmodia of the autumnal species begin to put in an appearance. The jelly-like whitish or greenish masses which later form our species of *Stemonitis* may be seen as early as July or August, but are most common in September. Probably not a linden tree falls to decay in our northern forests which does not bear at least one abundant crop of *Stemonitis*, certainly *S. maxima* Schw., and probably other species. The coniferous logs of Washington and Oregon, and doubtless of all our northern woods, bear quantities of *Stemonitis* in various species. *Comatricha* and *Dictydium* are common on logs of oak, while *Diderma floriforme* Bull. spreads its white or watery plasmodium inside oak stumps and forms its fruit in darkness, even sometimes in the ground. In the latter part of August and in September, the creamy plasmodium of *Mucilago* is everywhere in evidence, streaming amid piles of rotten leaves, climbing the living stems of herbaceous plants, there to hang in curious foamy masses of clustered fruit, an inch or two in length, unmistakable. The whole Trichiaceous series may now be sought, some with watery plasmodium rounding up in sporangia, white as ivory (*T. varia* Pers.), then dull yellow, ochraceous, orange; some with plasmodium scarlet, *T. decipiens* Pers., or rosy purple as *Arcyria denudata* L., or coral-red as *Hemitrichia vesparium* Batsch. In autumn too some of the most common Physarums are abroad with their plasmodia, on leaves, in wood-heaps everywhere, their fructifications on straw, on sticks, on every humble thing. Some species late in the year whiten, as if by frost, the earthward side of every fallen log, especially of aspen, linden, willow. Another autumnal form sure to be discovered is again one of the giant species, *Enteridium splendens* Morg. In some rocky damp ravine, on some barkless log, half rotten, we may discover a row of whitish or flesh-colored small cushion-like masses, perhaps a half a dozen of them. Another day we seek the place again; the cushions have changed to umber heaps covered with shining film, within like tiny sponges packed with spores.

To describe in detail the beauties of structure which the microscope reveals in the sporangia of these wonderful plants is beyond the scope of this paper. Some notion, however, of their variety and delicacy of form is given by the accompanying plate, which represents species of six of the forty and more generally known in the United States. All the species figured are found in New England, and one (*Comatricha cæspitosa* Sturgis) was first discovered there.

But it is proper now to offer a hint or two relative to the preservation and subsequent care of the materials we have gathered in wood and field. It is idle to collect the objects of natural history unless we may study them, and for satisfactory study they must be properly preserved. The care of the dainty forms we here discuss begins in the field. We should so carefully remove our material from its place of growth as not in the least to mar its pristine beauty. The collector should go armed with a stout knife, to cut away, if need be, a block of wood; he must carry a sufficient number of small boxes in which his finds may be stowed for safe transportation. Specimens, no doubt once good, often come in ruined by careless handling. If the specimen is to be of value it must be subject to no ill usage whatsoever.

Once we have our material at home it may be laid out on tables to dry, preparatory to mounting for the herbarium. Herbarium specimens are best cared for by mounting in small boxes, which may be selected of such size that a certain number will exactly fill a shallow covered tray, say one inch deep, and of the dimensions, outside, of standard herbarium-sheets. In these little boxes specimens may be so mounted as to be examined by the microscope with ease. A good method is shown by the accompanying figure. Here to the bottom of the box (*a*) is glued a bit of cork (*c*); on this is fastened by a drop of glue a bit of the material carrying the slime mould. This mount should be just so high in the box that the sporangia will escape the lid when the box is closed. A smaller bit of material may be similarly attached to the box side (*b*) for examination by the microscope in this position. Nearly all the small-fruited forms repay study, simply as dark objects, under the low powers of the microscope. No tiny natural objects evince a more elegant symmetry of form, more delicate shadings of color than do these.



For more exact study we must prepare our materials for investiga-

tion under lenses of highest magnifying power. To this end various methods of manipulation have been suggested. For some species it is desirable to mount the sporangium on the slide dry, in natural condition. This is essential in studying the *Stemonitis* species and the Cribrarias. Blown-out specimens are to be selected. In ordinary cases, however, we must resort to other methods, methods which will bring to all parts their natural fullness and will also render them less opaque. For these purposes, for temporary mounting, a weak solution of potassic hydrate will be found serviceable, to be followed by glycerine, if the specimen is to be kept any length of time.

But of the various matters of microscopic technique it is perhaps less needful here to speak. It is rather sought here to win for a hitherto little-noticed, but certainly remarkable group of living things a wider place in the attention and regard of students. Of course, for the proper appreciation of these things we must be children of nature, lovers of the natural world and sympathetic with all that goes on there. The consolations, the delights of nature are not for those who label things, who spend time in a vain attempt to harmonize the rules of nomenclature; her rewards are for those who love to watch the consistent harmony of her deathless cycles, and who in the secrets of her humblest forms can read the stately march of her sublime ongoings.

University of Iowa.

Explanation of Plate 16. — Fig. 1, *Tilmadoche viridis* (Bull.) Sacc., a single sporangium magnified x 25; 1*a*, the same reversed; 1*b*, the same after spore-dispersal; 1*c*, Capillitium from a similar sporangium x 750. Fig. 2, *Craterium minutum* (Leers) Fr., sporangia with unusually long stalks, magnified. Fig. 3. *Comatricha cæspitosa* Sturgis, a cluster of sporangia x 4; 3*a*, the capillitium highly magnified; 3*b*, a single spore x 1600. Fig. 4, *Enteridium splendens* Morgan, æthalium (compound mass, imperfectly divided within into sporangia) natural size; 4 *a*, a spore x 1400; 4*b*, capillitium x 420. Fig. 5, *Cribraria aurantiaca* Schrad., sporangium containing spores x 30. Fig. 6, *Arcyria denudata* (Linn.) Sheld. Sporangia, two expanded, one still closed x 20; 6*a*, a part of the capillitium x 750.

A BLUE-FRUITED HUCKLEBERRY.

B. L. Robinson.

While collecting some plants on the eastern shores of Thorndike Pond at Jaffrey, N. H., in the late summer of 1896, I noticed two varieties of fruit on the huckleberry bushes (*Gaylussacia resinosa*). The berries on some bushes were, according to the laws laid down for

them in most descriptive manuals, black and glossy, while those on neighboring bushes were pale blue and dull, being covered with a glaucous bloom, quite in the manner of the true blueberries (*Vaccinium pennsylvanicum* and *V. corymbosum*), which were growing near and permitted easy comparison. The two varieties of huckleberry were not invariably distinct, for other individuals were found with bluish-black berries of an intermediate character. Several plants of each kind were examined in much detail to discover other differences correlated with the color variation, but only two points were found, namely the size and sweetness of the fruit which were both preceptibly greater in the blue than in the black-fruited form. Some days later Mr. Walter Deane and I revisited the spot and after together verifying the previous observations, marked certain individuals to be watched during the next season.

I inquired of several country people, especially berry-pickers, whether they knew a blue-berried huckleberry. Without exception they said they did and that they regarded the blue kind better than the common black sort. Naturally I questioned them closely to be sure they were not confusing the blue huckleberry with any species of Vaccinium.

On returning to Cambridge, I searched for Botanical references to the blue-berried variety and found the following in Emerson's Trees and Shrubs of Massachusetts, p. 399 of ed. 1, regarding the species in question.

"The common variety has black shining berries and leaves green on both surfaces.

A second variety has similar leaves and berries covered with a blackish or brownish bloom.

A third variety has somewhat glaucous leaves and berries covered with a glaucous bloom.

A fourth variety has larger berries of a bluish color with a bluish bloom, and very rich to the taste."

I cannot doubt that the fourth is the variety which would properly include the blue-fruited plants on Thorndike Pond.

The following season I revisited several times the marked plants and found with interest that the blue-berried individuals were precocious in their development, being a week or two in advance of the black-berried form, both in coming into leaf and in the time of flowering. No differences of flowers or leaves were observable. One exhibiting specimens of the different forms at a meeting of the New England

Botanical Club in 1897, I learned that several members were familiar with the blue-fruited variety. Mr. J. H. Sears has since placed at my disposal a suite of specimens and notes from eastern Massachusetts. He has made out several differences between the black and the blue-fruited sorts, such as abundance of resinous excretions in the inflorescence, color of the cortex, form of corolla, etc., but with my best endeavors I have been unable to follow these distinctions when examining specimens from a wider range.

Recently Dr. Charles B. Graves of New London, Connecticut, independently discovered the blue-berried huckleberry in his region, and was about to publish upon it, but learning that I had been observing the plant he most courteously placed his material at my disposal.

Mr. Emerson's varieties have suffered the quick oblivion which is apt to overtake unnamed forms, and even our best recent floras continue to describe the fruit of *Gaylussacia resinosa* as black, without a bloom. It seems desirable therefore to place the blue-berried variety on more definite record, as follows: —

Gaylussacia resinosa, var. **glaucocarpa.** Berries dull, blue, covered with a distinct pale sericeous bloom, and tending to be large and of rich flavor for the species: plant precocious in foliation and anthesis in comparison with the typical form. — Rocky shores of Thorndike Pond, Jaffrey, N. H., collected by the writer August 23, 1896, no. 58 (type, in herb. Gray), and subsequently in the same locality at various times by Messrs. W. Deane, E. L. Rand, and E. F. Williams.

Apparently identical plants have been found at Topsfield, Massachusetts, by Mr. J. H. Sears, who also states that its fruit is earlier and larger than in the typical form; North Berwick, Maine, by Mr. J. C. Parlin. No. 1,157b of the beautiful set of plants recently distributed from Biltmore, North Carolina, by Mr. C. D. Beadle, is (so far as the specimen in the Gray Herbarium is concerned) of this variety. Plants collected by Dr. C. B. Graves at Waterford, Conn., have smaller blue fruit and may possibly prove a different variety.

Gray Herbarium.

Carex Novae-Angliae in eastern Massachusetts — In the Gray Herbarium are two sheets of *Carex Novae-Angliae*, Schw., collected by William Boott, one of which is labelled, "Purgatory Swamp, Dedham, July 10, 1861," and the other "Blue Hills, June 3, 1870."

On the latter sheet, in Mr. Boott's handwriting, are the words, "This specimen is good *Novae Angliae*. The rest of this sheet seems to be *Emmonsii*. Did this specimen really come from the Blue Hills?"

It is evident from this label that Mr. Boott was himself in doubt whether the one specimen of *Novae Angliae* on this sheet had really been collected with the others, or had accidentally got in among them. Many of our local botanists have sought for *Carex Novae-Angliae*, both in Purgatory Swamp and in the Blue Hills, but without success, so far as I am aware.

On June 15, 1899, I found three very good specimens in one of the wooded valleys between Great Blue and Hancock Hill. I was particularly anxious to find *Carex Novae-Angliae*, and examined every one of the many tufts of *Carex varia* growing in the shade of the young oak and chestnut trees. Three plants were all I could find, after a careful search, and it is probable that it is not abundant, even in the localities where it grows. — Geo. G. Kennedy.

Capsella in January. — As an addition to our January flora, I should like to mention that I have several times this year observed the Shepherd's purse — *Capsella bursa-pastoris* — blossoming in Roxbury, the first observation being on January 6, and the latest on the 26th. It had a particularly favored situation, growing in the cracks of a sidewalk, and being protected by a stone wall which faced towards the south. The flowers did not open fully, but some of them, at least, have produced seed, of which, however, I have not yet tested the fertility. The ovaries appeared abnormally large. — John Murdoch, Jr.

Roxbury, Mass.

NOTES ON ECHINACEA.

M. L. Fernald.

A handsome purple cone-flower of the prairies has during the past decade crept gradually eastward: and now, like its near relative the yellow cone-flower (*Rudbeckia hirta*), is appearing in New England hayfields. Unlike the latter plant, however, the purple cone-flower has not yet become a troublesome weed, but is so far an unusual species in the northeastern states.

This is a tall (1 m. or less) showy plant with entire lanceolate harsh leaves and slender drooping 2-toothed pale-purple rays 4 to 7 cm. long, and it has been called in the standard floras *Echinacea angustifolia*, DC., or by Britton & Brown *Brauneria pallida*, Britton. As an indigenous plant it is found from Michigan and Illinois to Alabama and Texas, flowering in June and July, though, as stated, it is now becoming a weed by roadsides and in hay-fields in New England.

Another plant which has generally been associated with this tall species with long drooping rays, and which like it is labelled in most herbaria *Echinacea angustifolia*, is of broader range, generally growing only two or three decimeters high, and with 2-3-toothed rays much shorter (2 or 2.5 cm. long) and spreading, not drooping. This low harsh plant, with short spreading rays, is found from Tennessee to the Saskatchewan, Wyoming and Texas, and in different sections of its range it flowers from May (Texas) to August (Tennessee). In a recent paper, Mr. C. D. Beadle has described it as a new species, *Brauneria tennesseensis*.[1]

That Mr. Beadle has good grounds for dividing into two species the material which has passed as *Echinacea angustifolia* (*Brauneria pallida*) there seems no doubt. But that he, before launching as an undescribed species his *Brauneria tennesseensis*, or that Dr. Britton, before making the new combination *Brauneria pallida* and placing under it *Echinacea angustifolia*, could have examined with care the descriptions of the earlier species of the group, does not seem possible.

The first of these entire-leaved species was described from Arkansas by Nuttall as *Rudbeckia pallida*,[2] with "rays very long, dependent, bidentate, stem elongate, monocephalous," and in a note Nuttal adds "greatly resembling *R. purpurea* [*Echinacea purpurea*] . . . the peduncle, or part of the stem destitute of leaves, fourteen or sixteen inches long." From this description and note there is no hesitation in identifying with Nuttall's species the tall plant with long drooping rays, now becoming naturalized in the northeast. The species first described by Nuttall as *Rudbeckia pallida* was afterwards placed by him in *Echinacea* and should be known as *Echinacea pallida*, Nutt.

Only two years after Nuttall first described his species, De Candolle took up in the Prodromus Moench's genus *Echinacea*. *E. purpurea* was described with "ligules very long, dependent, the apex acute,

[1] Bot. Gaz. xxv. 359.

[2] Jour. Acad. Philad. vii. 77.

bidentate," and *E. serotina*, a plant now referred to *E. purpurea*, was described with "rays 2-3-dentate, spreading not dependent, shorter than in the preceding [*E. purpurea*]." Immediately following *E. serotina* he characterized *E. angustifolia*, from Texas, with "stem hispid, leaves all linear-lanceolate, hispid, entire, the radical subpetiolate, the cauline sessile . . . rays shorter than in the preceding, spreading." Now in view of the double comparison given by De Candolle, the rays of *E. serotina* shorter than in *E. purpurea*, and again those of *E. angustifolia* still shorter and spreading, we are hardly justified in placing with the latter species the tall plant (*Rudbeckia pallida*, Nutt.) with long drooping rays."

Yet in the "Botanical Club Check List" Dr. Britton, following earlier precedents of uniting as one species De Candolle's *Echinacea angustifolia* and Nuttall's *E. pallida*, took up for the two plants the earlier specific name *pallida* and made a new combination for them, *Brauneria pallida*, Britton. Later, in discussing his *B. tennesseensis*, Mr. Beadle interprets as true *B. pallida* the tall plant with long drooping rays. If by *Brauneria pallida* is meant *Rudbeckia* (*Echinacea*) *pallida*, Nutt., this interpretation seems justified. But it is not readily seen upon what grounds Mr. Beadle separates his *Brauneria tennesseensis* from the *Echinacea angustifolia* of De Candolle. The original description of the latter species agrees perfectly with the low hispid short-rayed plant already referred to as growing from Tennessee westward. The type of *E. angustifolia* came from near Austin, Texas, and we may take as representing that species in American herbaria, Mr. Heller's no. 1735 from Kerrville, about eighty miles southwest of Austin, a plant which perfectly matches De Candolle's description. A careful comparison fails to show any appreciable differences between this plant of Mr. Heller's and material of *Brauneria tennesseensis* collected by Mr. Beadle, and formerly by Dr. Gattinger at the original station near La Vergne, Tenn.

The marked characters and the synonymy of these two entire-leaved species, briefly stated, are

Echinacea pallida, Nutt. Tall 1m. or less high: rays slender and drooping, 4 to 7 cm. long, 2-toothed at tip, pale or dark rose-purple. — Trans. Am. Phil. Soc. n.s. vii. 354. *E. sanguinea*, Nutt. l.c. *E. angustifolia*, Am. authors, in part. *Rudbeckia pallida*, Nutt. Jour. Acad. Philad. vii. 77. *Brauneria pallida*, Britton, Mem. Torr. Club, v. 333, in part. — Michigan and Illinois to Alabama and Texas. Sparingly introduced along roadsides and in fields in New England.

E. Angustifolia, DC. Low, 2 to 5 dm. high: rays short, 2 to 2.5 cm. long, spreading, 2-3-toothed, purplish to white. — Prodr. v. 554; and Am. authors in part. *Brauneria pallida*, Britton, l.c., at least as to synonym. *B. tennesseensis*, Beadle, Bot. Gaz. xxv. 359. — Tennessee to the Saskatchewan, Wyoming, and Texas.

Gray Herbarium.

A pink-flowered form of Rubus triflorus. — In 1898, I found, growing near Farmington village, a number of specimens of *Rubus triflorus* with flowers which were almost a bright pink. At least a dozen of these plants were scattered along a roadside, and occupied a space two rods in length. The same pink form had been noticed in this place a year before, and with its colored petals strongly contrasted with the typical white-flowered plant, with which it grew. — H. W. Jewell, Farmington, Me.

Eragrostis Frankii in Connecticut. — Mr. Hoffmann in Rhodora I, 230, records the occurrence of *Eragrostis Frankii*, Steud., in Berkshire County, Massachusetts, stating that it had not been previously reported north of New Jersey. It may be worth while to record an intermediate station at East Windsor, Connecticut, where I collected specimens in 1897. Some of these were deposited in the Herbarium of the New England Botanical Club, March, 1898. — C. H. Bissell, Southington, Connecticut.

Minnesota Plant Life,[1] by Prof. Conway MacMillan of the University of Minnesota, may be mentioned as a recent and attractively illustrated volume upon the habital and biological features of a vegetation not very unlike that of middle altitudes in the northern half of New England. In a commendable effort toward simple diction, not hitherto conspicuous in works from the same pen, technical words are scrupulously avoided. However, when in place of pretty generally known Latinized terms we find such expressions as "four-leaved water-fern," "fertile lobe of the adder's tongue fern leaf," "seed-rudiment-producing tree," the simplification seems a trifle labored.

[1] Report of the [Minnesota] Survey, Botanical Series iii. Large 8vo., xxv and 568 pages. St. Paul, 1899.

Notes on Vermont Plants.— In Rhodora 1: 155, Mr. E. L. Rand notes the occurrence of *Subularia aquatica* on Mt. Desert Island. It may be of interest to know that this diminutive crucifer grows in great luxuriance in South Pond, Marlboro, Vermont, some ten miles from Brattleboro, at an estimated elevation of 1,000 to 1,500 feet above sea-level. My observations as to the depth at which it grows agree perfectly with those of Mr. Rand.

In Rhodora 1: 172, Mr. H. W. Jewell reports the occurrence of *Vaccinium uliginosum* at an altitude of only 300 to 400 feet. I have collected it at about the same altitude on the banks of the Lamoille River in Johnson, Vermont. *Vaccinium caespitosum* is abundant, and fruits freely along the banks of the West River at Newfane, Vermont, not over 300 or 400 feet above sea-level. This locality is of easy access, as it is on rocks just south of the Newfane end of the bridge to Brookline. — A. J. Grout, Boys' High School, Brooklyn, N. Y.

The fifth annual winter meeting of the Vermont Botanical Club was held at the University of Vermont, January 26 and 27, 1900. Twenty or more papers of general and local interest were presented. An interesting discussion on the nature of species was led by Prof. F. A. Waugh and Dr. E. A. Burt. The former maintained that the more plant species were studied the more intergrading forms were found; and that species were created by man, not by nature. Dr. Burt, while admitting this often to be the case, held that there were certain well-defined gaps between species. Pres. Brainerd explained recent division of composite species, particularly in *Antennaria*.

The results of experiments upon the dehiscence of the Sporogonium of *Pteris cretica* were given by Miss Ethel Bates of Middlebury. She showed the dehiscence was due to variations in temperature rather than in moisture, as is commonly stated.

Prof. W. J. Morse, of Montpelier Seminary, led an interesting and profitable discussion of what should be included in the course in botany of the high school and academy.

Over one hundred new species of flowering plants were reported for the flora of Vermont by members of the club during the year. This, and other facts concerning the results of last year's work, were presented by W. W. Eggleston.

The officers of the club were reëlected, as follows: President, Ezra Brainerd; vice-president, C. G. Pringle; secretary and treasurer, L. R. Jones. — The midsummer meeting will be held at Willoughby Lake the second week of July. — C. D. Howe.

PRELIMINARY LISTS OF NEW ENGLAND PLANTS VI,—LEGUMINOSAE.[1]

J. R. Churchill.

[The sign + indicates that an herbarium specimen has been seen; the sign — that a printed record has been found.]

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Amphicarpa monoica, Nutt.	+	+	+	+	+	+
Apios tuberosa, Moench	+	+	+	+	+	+
Astragalus alpinus, L.	+	+	+			
" Canadensis, L.			+			
" Robbinsii, Oakes			+			
" Blakei, Eggleston	+	+	+			
Baptisia tinctoria, R. Br.	—		+	+	+	+
Cassia Chamaecrista, L.	—			+	+	+
" Marilandica, L.	—	+	+	+	+	+
" nictitans, L.	—		+	+	+	+
Coronilla varia, L.	+		+	+	—	+
Crotalaria sagittalis, L.	—		+	+	+	+
Cytisus scoparius, Link.				+		
Desmodium acuminatum, DC.	+	+	+	+	+	+
" Canadense, DC.	+	+	+	+	+	+
" canescens, DC.			—	+	+	+
" ciliare, DC.				+	+	+
" cuspidatum, T. & G.	—		+	+	—	+
" Dillenii, Darl.	+	+	+	+	+	+
" Marilandicum, F. Boott	—			+	+	+
" humifusum, Beck.				—	—	
" nudiflorum, DC.	+	+	+	+	+	+
" paniculatum, DC.	+	+	+	+	+	+
" rigidum, DC.				+	+	+
" rotundifolium, DC.	—		—	+	+	+
" sessilifolium, DC.				+	+	+
" strictum, DC.						—
Genista tinctoria, L.	+			+		
Hedysarum boreale, Nutt.	+		+			
Lathyrus maritimus, Big.	+	+	+	+	+	+
" ochroleucus, Hook.			+	—		
" palustris, L.	+	+	+	+	+	+
" " var. myrtifolius, Gray.	+		+	+		
" pratensis, L.	+			+		
Lespedeza angustifolia, Ell.				+		

[1] Printed in Rhodora as supplementary material.

	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Lespedeza capitata, Michx.	+	+	+	+	+	+
" intermedia, Britt.	+	+	+	+	+	+
" Nuttallii, Darl.				+	+	
" polystachya, Michx.	+		+	+	+	+
" procumbens, Michx.	—		—	+	+	+
" Stuvei, Nutt.				+	+	—
" violacea, L.	—		+	+	—	+
" reticulata, Pers.				+	+	+
Lupinus perennis, L.	—	+	+	+	+	+
Medicago Arabica, All. (*M. maculata*, Willd.)	+	—		+	+	
" hispida, Gaert. (*M. denticulata*, Willd.)	+	+	+	+	+	
" laciniata, All.	+			+		
" lupulina, L.	+	—	+	+	+	+
" sativa, L.	+	+	+	+	+	+
Melilotus alba, Lam.	+	+	+	+	+	+
" officinalis, Willd.	+	+	+	+	+	+
Oxytropis campestris, DC., var. Johannensis, Fernald	+					
Phaseolus perennis, Walt.						+
Robinia hispida, L.				+	+	+
" Pseudacacia, L.	+	+	+	+	+	+
" viscosa, Vent.	+	+	+	+		+
Strophostyles angulosa, Ell.	—			+	+	+
Tephrosia Virginiana, Pers.	—			+	+	+
Trifolium agrarium, L.	+	+	+	+	+	+
" arvense, L.	+	+	+	+	+	+
" hybridum, L.	+	+	+	+	+	+
" incarnatum, L.	+	+	+	+	+	+
" medium, L.	—			+	—	
" pratense, L.	+	+	+	+	+	+
" procumbens, L.	+	+	—	+	+	+
" dubium, Sibth. (*T. procumbens*, var. *minus*, Gray)				+		+
" repens, L.	+	+	+	+	+	+
Vicia Cracca, L.	+	+	+	+	+	+
" hirsuta, Koch.				+	+	—
" sativa, L.	+	+	+	+	+	+
" " var. angustifolia, Ser.		—	+	—	+	
" tetrasperma, Moench	+		+	+	—	+
" Caroliniana, Walt.	—					

NOTES UPON THE ABOVE LIST.

Amorpha fruticosa, L. (see RHODORA 1: 164), and *Gleditschia triacanthos*, L., frequently collected along roadsides, etc., and reported as "escapes," are not well established as wild, but rank rather with the horse-chestnut (RHODORA 1: 214), and some other trees, as merely plants of cultivation.

Amphicarpa Pitcheri, T. & G. There are specimens collected in eastern Massachusetts, in the herbarium of Mr. W. P. Rich, which cannot be distinguished from this species. See RHODORA 1: 27. I have also seen, in the herbarium of Dr. E. H. Eames of Bridgeport, Conn., plants collected by him near that city, which are almost identical with the western species. Yet mature fruit from this station, which Dr. Eames kindly sent me, quite lacks the hairy valves so characteristic of *A. Pitcheri*. Without further material and study, it seems at least premature to include *A. Pitcheri* in our list as a New England plant.

Astragalus Blakei, Eggleston, Bot. Gazette, XX; 271, June, 1895 (*A. Robbinsii*, Oakes, var. *Jesupi*, Eggleston & Sheldon, Minn. Bot. Studies, XV, 155, June, 1894). Dr. B. L. Robinson has made a careful investigation of the validity of this species, with the result indicated in our list. I add here, also, his interesting notes as follows: "We have in New England, besides *A. alpinus* and *A. Canadensis*, two species of Astragalus, namely: 1–*A. Robbinsii*, Oakes, with small, light-colored flowers, and a rather short, flattish pod, which is shortly acuminate, has no dorsal sulcus, and exhibits only the minutest trace of a septum from the dorsal suture. This appears to be a local Vermont species. (Type specimen from Winooski River, Burlington. This station is now extinct.) 2–*A. Blakei*, Eggleston, with larger, more deeply-colored flowers, and longer, acuminate, triangular pods, with dorsal sulcus and a partial septum intruded from the dorsal suture. This species has also borne the names *A. Robbinsii*, var. *occidentalis*, Wats. and *A. occidentalis*, Jones. It is evidently like *A. alpinus*, a species of wide range, extending from Maine, through northern New Hampshire and Vermont, and to the far West."

Mr. W. W. Eggleston tells me that Perkins' report of *Desmodium canescens* in Vermont (based upon Robbins' plant from Pownal) is probably erroneous.

Two species of *Medicago*, not mentioned in the list, but reported in the Flora of Middlesex County, and based upon specimens now in the herbarium of the New England Botanical Club, were incorrectly de-

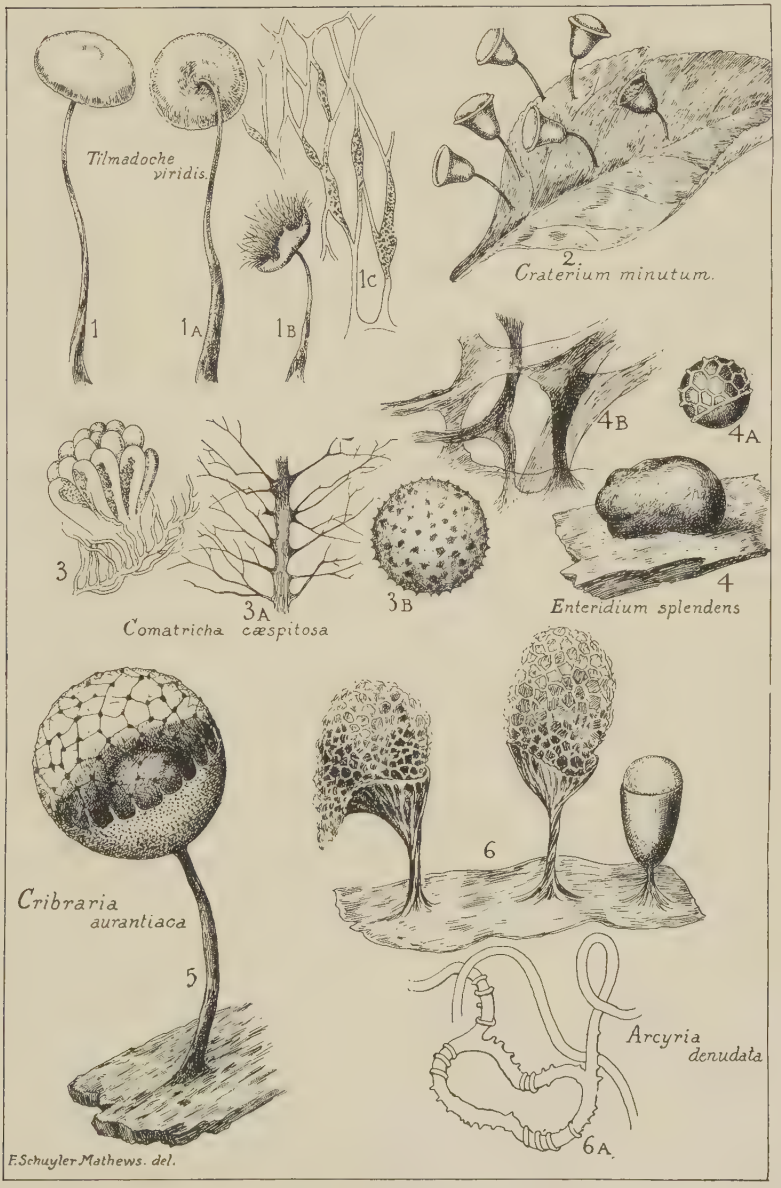
termined, and should be revised as follows: *M. aculeata* is *M. agrestis*, Ten., *M. lappacea* is *M. hispida*, Gaertn. var. *apiculata*, Urban. *Trigonella Cassia*, of the same flora, is *T. Nocana*, Boiss. There are other Medics which have crept into local lists, but they are mere waifs or ballast plants, and scarcely deserve mention. Plants equally ephemeral, sometimes collected from dumps, and reported in local floras, are *Lathyrus sativus*, L., *Phaseolus vulgaris*, L., *Pisum sativum*, L., *Lotus corniculatus*, L., *Scorpiurus subvillosus*, L., and others. They are transient relics of cultivation, rarely persistent, and are better omitted.

Regarding *Oxytropis campestris*, DC., see Rhodora **1**: 85.

Phaseolus perennis, Walt., is credited generally to New England in Gray's Manual and in the Illustrated Flora. It is mentioned as "not common" in Jackson's Flora of Worcester County (Mass.). After a thorough ransacking of our principal herbaria, and correspondence with Mr. Jackson and others, it seems clear that the report of its occurrence in Worcester County is without foundation; and that the record for New England rests at present solely on three specimens, all collected many years ago at New Haven, Conn. One of these sheets, in the Gray Hebarium, is without date, but it bears the stamp of the "Torrey & Gray Flora," and the label reads simply: "Phaseolus perennis, New Haven. Dana." In the Eaton Herbarium at New Haven is a specimen collected by A. B. Eaton at New Haven in 1859. The third sheet is in the Herbarium of Columbia College; and for the account of the ancient and fragmentary specimen thereon I am indebted to Mr. Roland M. Harper, student of botany in the University. The label reads as follows: "P. perennis. New Haven, Ct. recd. by Dr. Robbins from Shephard or Shorter. This is my only specimen. I should be glad to have you tell me if it is perennis & send it back when convenient." This sheet, too, bears the stamp, "Torrey Herbarium," but the label is neither signed nor dated. Dr. Britton, affirming the authenticity of the specimen, ventures the opinion that the label is in the handwriting of Oakes. Now will our New Haven botanists tell us where the station was and whether it is now extinct?

Trifolium stoloniferum, Muhl., is reported in Perkins' Catalogue of Vermont Plants, from Bellows Falls. President Brainerd writes that it is doubtless an error, or possibly a waif. No specimen is extant, and no recent collector has been able to find it there.

Vol. 2, No. 15, including pages 53 to 74 and plate 15, was issued March 6, 1900.



MYXOMYCETES

From "The North American Slime Moulds," by Thomas H. MacBride. Reproduced by permission of the Macmillan Company.

NURSERYMEN'S DIRECTORY

ORNAMENTAL TREES, SHRUBS, VINES AND HERBACEOUS PLANTS. Seedlings and Transplanted Native Trees and Shrubs. Large and Well Developed Stock for Permanent Planting. Shade Trees from six to fifteen feet in height. Healthy and well-rooted. Strong Field-Grown Clumps of Hardy Perennials. Stock for Parks, Cemeteries and Suburban Places a Specialty. Send 6 cents in stamps for Descriptive Catalogue; contains Prices of large and Small Trees, and for Stock in quantities, and colored plate of New Hybrid Wichuariana Roses. THOMAS MEEHAN & SONS., Germantown, Philadelphia, Pa.

OLD COLONY NURSERIES, 1840–1899. Hardy Shrubs, Trees, Vines, Evergreens and Perennials. Priced Catalogue free on application. T. R. WATSON, Plymouth, Mass.

FRUIT AND ORNAMENTAL TREES at Reasonable Prices. Small Fruits, Grapes, Shrubs, Climbing Plants, Roses, Evergreens, Hardy Plants, Pæonies. Largest and choicest collections in America. Best Novelties. Descriptive Illustrated Catalogue free. ELLWANGER & BARRY, Mount Hope Nurseries, Rochester, N. Y. Fifty-ninth Year.

CONCORD NURSERIES, Concord, Massachusetts. Established on Minot Pratt's Homestead by his son, F. G. PRATT. Over 300 species grown, including *Rhodora*, pink and white, Andromedas, Cornels, Viburnums, Kalmias, Ivy, Myrica, Benzoin, Hamamelis. E. Mass. plants collected. Catalogue.

BEAUTIFUL BRIGHT-COLORED SPECIMENS OF THE ROCKY MOUNTAIN EVERGREENS: Picea Pungens, Picea Engelmanii, Abies Douglasii and Concolor. Also 300,000 twice transplanted Hemlocks and all other varieties of hardy evergreens. Ask for catalogue and mention this journal. Address D. HILL, Evergreen Specialist, Dundee, Ill.

WM. F. BASSETT & SON, Hammonton, N. J. General Collection of Hardy Plants and Hardy American Shrubs, collected and cultivated. Specialties: Plants of New Jersey Pine Region and eastern Pennsylvania. Hibiscus in var., Xerophyllum, Clethra, Schizæa, Droseras, Apios, Asclepias, Narthecium, Centrosema, Andromedas in var., Typha angustifolia. Catalogue.

REA BROTHERS, Norwood, Mass. — Viburnum tomentosum: A rare and beautiful shrub. **New and rare** Hardy Herbaceous Plants our specialty. Descriptive Catalogue of **Hardy Plants** Free. Special prices for collections and large quantities.

Advertisements of Nurserymen and Dealers in Botanical and other Scientific Publications are inserted in these pages at the following rates per space of 4 in. by ¼ in. 1 year, $4.00. 6 months, $2.50.

Observations on the Colors of Flowers,

By E. WILLIAMS HERVEY.

This pamphlet of 100 pages contains among other interesting matter, the first and only explanation ever given in print of the true nature and origin of the special markings known as Honey Guides.

Price, 75 cents. For sale by

W. B. CLARKE CO., Boston, Mass.,

and CAMBRIDGE BOTANICAL SUPPLY CO.,

Cambridge, Mass.

THE STANDARD BOTANIES.

GRAY'S MANUAL OF BOTANY. Sixth edition. Revised and extended westward to the one-hundredth meridian, by Sereno Watson, Curator of the Gray Herbarium, Harvard University, and John M. Coulter, Professor of Botany in Wabash College, assisted by specialists in certain groups. Cloth, 8vo, 828 pages, and 25 plates. Price, $1.62, postpaid.

GRAY'S FIELD, FOREST, AND GARDEN BOTANY. New edition. Revised and extended by Professor L. H. Bailey, of Cornell University. Cloth, 8vo, 519 pages. Price, $1.44, postpaid.

GRAY'S LESSONS AND MANUAL. Comprising the Lessons in Botany, Revised, and the Revised Manual. Cloth, 8vo, 1,056 pages, and 25 plates. Price, $2.16, postpaid.

GRAY'S SCHOOL AND FIELD BOOK OF BOTANY. Comprising the Revised Lessons in Botany, and the Revised Field, Forest, and Garden Botany. The text-book in most common use in the high schools of the United States. Cloth, 8vo, 745 pages. Price, $1.80, postpaid.

AMERICAN BOOK COMPANY, 93 Summer St., Boston, Mass.

New York. Cincinnati. Chicago.

A GLOSSARY FOR STUDENTS OF THE FLESHY FUNGI, by DR. E. A. DANIELS (over 1000 terms) can be had of the Boston Mycological Club, box 21, Cambridge, Mass. Price 25 cents. Also, Club Bulletins (3 to 8) for 75 cents the set.

WAYSIDE FLOWERS, by F. SCHUYLER MATHEWS, with 100 life-size drawings from nature by the author. In four parts, according to season.

WAYSIDE TREES, by F. SCHUYLER MATHEWS, with drawings from nature by the author. In four parts. Price, 30 cts. per part. Published by THE TABER-PRANG ART CO., Springfield, Mass.

BOTANICAL PUBLICATIONS

SYNOPTICAL FLORA OF NORTH AMERICA, by A. GRAY and others. Vol. I. Fascicles 1 and 2. A critical treatment of forty-five families of polypetalæ (*Ranunculaceæ to Polygalaceæ*) 1895-1897. $5.20. — GRAY HERBARIUM of Harvard University, Cambridge, Mass.

FLORA OF MIDDLESEX COUNTY, MASSACHUSETTS, by L. L. DAME and F. S. COLLINS, 1888. Price $2.00, post free. — Address F. S. COLLINS, 97 Dexter Street, Malden, Mass.

FLORA OF MT. DESERT ISLAND, MAINE, by EDWARD L. RAND and JOHN H. REDFIELD. With a Geological Introduction by WILLIAM MORRIS DAVIS. 1894. Price, $2.00, post free. — Address EDWARD L. RAND, 53 State Street, Boston, Mass.

NEW ENGLAND WILD FLOWERS AND THEIR SEASONS, by WILLIAM WHITMAN BAILEY. Price 75 cents net. — PRESTON & ROUNDS CO., Providence, R. I.

AMERICAN GARDENING, A Weekly Illustrated Journal of Horticulture and Gardeners' Chronicle. Sample copies free. 136 Liberty St., New York.

THROUGH GLADE AND MEAD, A Contribution to Local Natural History, with a Flora of Worcester County, Massachusetts, by JOSEPH JACKSON. 1894. $2.00 (to subscribers to this journal). The Flora in separate form, 75 cents. — Address JOSEPH JACKSON, 15 Woodland Street, Worcester, Mass.

THE ASA GRAY BULLETIN, an illustrated botanical magazine. Special attention given to Cryptogams. Bi-monthly, 50 cents per year. Sample free if this journal is mentioned. — Address THE ASA GRAY BULLETIN, Takoma Park, D.C.

CAMBRIDGE BOTANICAL SUPPLY COMPANY, Cambridge, Mass. All books relating to Botany furnished, and Schools, Colleges, and Herbariums supplied. Estimates given.

STUDENTS' HAND-BOOK OF MUSHROOMS OF AMERICA. Edible and Poisonous, by THOMAS TAYLOR, M.D., author of Food Products, etc. Fine illustrations in color and in half-tone. Paper, $2.50; cloth, $3.00. —A. R. TAYLOR, Publisher, 238 Mass. Ave., N. E., Washington, D. C. Order through your bookseller, or send retail price to publisher.

CAMBRIDGE BOTANICAL SUPPLY COMP'Y,

1286 Massachusetts Avenue, opposite College Library, CAMBRIDGE, MASS.

MUSHROOM BOOKS. Peck's Mushrooms and their use. 80 pages. 32 illustrations. Postpaid, 50 cents.

"THE BEST INTRODUCTION TO THE STUDY OF MUSHROOMS."

☞ **Send for new general catalogue of 853 items useful to botanists, and book list of 561 entries.**

EVERYTHING USEFUL TO BOTANISTS.

JUST READY.

BOTANIZING.

A complete Manual for the collector, by Prof. William Whitman Bailey, Brown University. Price, 75 cents.

Sent postpaid upon receipt of price by the publishers,

PRESTON & ROUNDS COMPANY, Providence, R. I.

A Valuable Herbarium for Sale.

The general herbarium of the late Dr. Bockeler, of Varel, Germany, is now offered for sale (other disposition having been made of his extensive collection of **Cyperaceae.**)
The herbarium is in an excellent state of preservation and contains about 12,000 species. The flora of Central Europe and of the Mediterranean Region is very fully represented. There are also numerous sets from Africa and the Orient. Finally there are single families from the herbarium of K. Sprengel.
Those interested can obtain fuller information on application to

H. COUNT OF SOLMS-LAUBACH,

Botanical Institute of the University,

STRASBURG, ALSACE.

THE LOCAL FLORAS OF NEW ENGLAND, by MARY A. DAY. A detailed bibliography of floras, plant lists, and keys, including 258 titles, arranged by states and counties. Price, 35 cents, postpaid. GRAY HERBARIUM, Cambridge, Mass.